Turbulence and its modelling is covered in detail in Chapter 5. RANS is introduced and details of various turbulence models covered, including numerous corrections and updates that have been developed, transition modelling, free stream turbulence representation, and surface roughness. Again code implementation issues are discussed. URANS, DES, LES, and various hybrid options are then addressed in some detail. This is probably the most detailed and useful text I have read outside of a specialist turbulence modelling book.

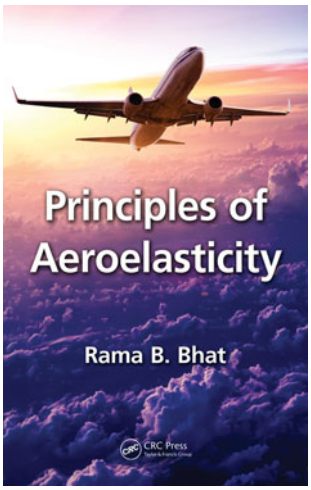
Chapter 6 is entitled 'Advanced Simulation' and considers many aspects of applied use of numerical methods, including: design optimisation; optimisation and surrogate modelling approaches; multi-fidelity approaches; multi-physics approaches; various forms of reduced order models; coupled models; multi-scale problems; code-coupling methods; and acoustics is covered in significant detail. Again, excellent examples are presented for many test cases.

Pre- and post-processing methods are considered in Chapter 7, covering numerous issues from geometry and feature handling and their effects on mesh generation, wall distance calculations, required parameter definitions and considerations, through file formats, assessing convergence, to visualisation and feature detection.

The book is completed with a future outlook, including a discussion of the challenges in terms of applications and physics modelling, and algorithmic challenges particularly related to scalability and exploitation of emerging hardware.

In summary, this book would make very interesting reading for any graduate student, researcher or practitioner in the numerical aerodynamics field. It provides sufficient background and technical detail to be able to develop and understand detailed numerical methods and also covers some more advanced material in a manner that can be followed. It would make a valuable addition to the library of anyone with an interest in this area.

Professor C. B. Allen, MRAeS



Principles of Aeroelasticity

R. B. Bhat

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One of the author's motivation to write this book is 'there are no suitable textbooks in this area' as stated in the book's preface. In my view however, this book is premature in context, technical contents and presentation quality.

The key points of concern in most of the chapters are listed below.

The author's statement quoted above is not true or at least confusing since there are already a few excellent books in this topic as mentioned in the preface. In addition, there is a book of exactly the same title *Principles of Aeroelasticity* by Raymond L. Bisplinghoff and Holt Ashley (Addison-Wesley Pub. Co. Inc. 1955. subsequently reprinted by Dover Publications). The title therefore should be justified.

Since 'This book does not suppose that the student has already taken courses in the theory of vibrations', the Introduction seems too brief and lack of figures to present adequate background of this subject. A short introduction of aircraft design with a figure of aircraft and the aeroelasticity triangle to relate relevant subjects would offer a global view over this field.

The title of Chapter 3 is 'Static Aeroelasticity'. However, apart from the aeroelastic triangle in the introduction, the technical contents have little to do with aeroelasticity, but include only shear centre and shear flow of a thin-walled open-section. In the introduction to Chapter 4, wind load is described as the excessive aerodynamic load causing wing divergence. In fact, divergence speed is a critical constraint for aircraft design specified in airworthiness, not dependent upon wind load. In this book, airworthiness should have been mentioned as aircraft design guidance and reference. Wind load should be related to gust response, which is another aeroelastic phenomenon of flexible aircraft not included in this book.

Although control surface reversal is one of the aeroelastic phenomenon, it is actually opposite to divergence. They should be distinguished rather than mixed up in the same Chapter 6. In the first part of Chapter 6, all equations for system vibration have not been numbered. In Chapter 7, the 1-D aeroelasticity is the same as divergence as introduced in Chapter 3. This should be made clear in the introduction with reference to the aeroelastic triangle and Chapter 3. The eigen-solution should lead to divergence speed solution, which is the primary concern for application purpose. However, the divergence speed is not presented in any formula or related to the theoretical study.

In Chapter 8, the reversal speed should be the primary concern for application purpose. However, the term 'reversal speed' has not been mentioned and extracted from the equations. In Chapter 9 'Flutter of a Cantilever Wing', flutter speed should be the primary concern for application purpose. However, the term 'flutter speed' or 'flutter velocity' has not even been mentioned. If Chapter 12 were presented before Chapter 9, the study would lead to an approach of calculating flutter speed.

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